

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
19 February 2004 (19.02.2004)

PCT

(10) International Publication Number  
WO 2004/014922 A1

(51) International Patent Classification<sup>7</sup>: C07D 513/04,  
A61P 25/28, 35/00, 31/10, A61K 31/428, 31/416

Cambridge Science Park, Milton Road, Cambridge  
CB4 0QA, UK

(21) International Application Number:  
PCT/GB2003/003474

(74) Agents: HUTCHINS, Michael, Richard et al.; M.R.  
Hutchins & Co., 33 Connaught Way, Tunbridge Wells,  
Kent TN4 9QP (GB).

(22) International Filing Date: 8 August 2003 (08.08.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
0218625.2 10 August 2002 (10.08.2002) GB  
0312509.3 31 May 2003 (31.05.2003) GB

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU,  
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,  
CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,  
GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,  
LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,  
MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE,  
SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ,  
VC, VN, YU, ZA, ZM, ZW.

(71) Applicant (*for all designated States except US*): ASTEX  
TECHNOLOGY LIMITED [GB/GB]; 436 Cambridge  
Science Park, Milton Road, Cambridge CB4 0QA (GB).

(84) Designated States (*regional*): ARIPO patent (GH, GM,  
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),  
Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),  
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,  
ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO,  
SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM,  
GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(72) Inventors; and

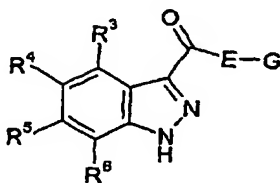
(75) Inventors/Applicants (*for US only*): BERDINI, Va-  
lerio [GB/GB]; 436 Cambridge Science Park, Milton  
Road, Cambridge CB4 0QA (GB). CARR, Maria  
[GB/GB]; 436 Cambridge Science Park, Milton Road,  
Cambridge CB4 0QA (GB). SAXTY, Gordon [GB/GB];  
436 Cambridge Science Park, Milton Road, Cambridge C  
0QA (GB). WOOLFORD, Alison, Jo-Anne [GB/GB];  
436 Cambridge Science Park, Milton Road, Cambridge  
CB4 0QA (GB). WYATT, Paul, Graham [GB/GB]; 436

Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guid-  
ance Notes on Codes and Abbreviations" appearing at the begin-  
ning of each regular issue of the PCT Gazette.

(54) Title: 3-(CARBONYL) 1H-INDAZOLE COMPOUNDS AS CYCLIN DEPENDENT KINASES (CDK) INHIBITORS



(I)

(57) Abstract: The invention provides a compound of the formula (I): wherein E is O, S, or NH; G is selected from hydrogen; carbocyclic and heterocyclic groups having from 3 to 12 ring members; and acyclic C<sub>1-8</sub> hydrocarbyl groups optionally substituted; provided that E-G is not OH or SH and further provided that E-G does not contain the group O-O; two adjacent moieties selected from R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup> and R<sup>6</sup>, together with the carbon atoms to which they are attached, form a fused heterocyclic group having from 5 to 7 ring members and 1, 2 or 3 ring heteroatoms selected from N, O and S; and the other two moieties selected from R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup> and R<sup>6</sup> are the same or different and are each as defined in the description. The Invention also provides compounds of the formula (I) for use as inhibitors of cyclin dependent kinases and for use in the treatment of disease states and conditions mediated by cyclin dependent kinases.

# INTERNATIONAL SEARCH REPORT

PCT/GB 03/03474

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C07D513/04 A61P25/28 A61P35/00 A61P31/10 A61K31/428  
A61K31/416

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
IPC 7 C07D A61K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

CHEM ABS Data, EPO-Internal

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 01 57008 A (BASF AG ;ERICSSON ANNA (US); SCOTT BARBARA (US); ARNOLD LEE D (US)) 9 August 2001 (2001-08-09) page 39, line 14 -page 40, line 22; example 280 ---	1-73
Y	WO 99 24035 A (SQUIBB BRISTOL MYERS CO) 20 May 1999 (1999-05-20) claims 1,9 ---	1-73
A	WO 01 098290 A (PHARMACIA & UPJOHN S.P.A., ITALY) 27 December 2001 (2001-12-27) cited in the application page 27, line 17 -page 31, line 19; claims 1,33,38,39; examples 268-299 --- -/-	1-73

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

### \* Special categories of cited documents :

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the International filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the International filing date but later than the priority date claimed

- \*T\* later document published after the International filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- \*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- \* & \* document member of the same patent family

Date of the actual completion of the International search

17 October 2003

Date of mailing of the International search report

30/10/2003

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Schuemacher, A

# INTERNATIONAL SEARCH REPORT

PCT/GB 03/034/4

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 96 02537 A (SMITHKLINE BEECHAM PLC ;FORBES IAN THOMSON (GB); JONES GRAHAM ELGI) 1 February 1996 (1996-02-01) cited in the application claim 1 -----	1-73
E	WO 03 070236 A (PHARMACIA ITALIA S.P.A., ITALY) 28 August 2003 (2003-08-28) page 20, line 24 -page 23, line 30; claims 1,8,31,32 -----	1-73

# INTERNATIONAL SEARCH REPORT

PCT/GB 03/03474

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:  
Although claims 66-70 are directed to a method of treatment of the human/animal body, the search has been carried out and based on the alleged effects of the compound/composition.
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this International application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

### Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

# INTERNATIONAL SEARCH REPORT

PCT/GB 03/03474

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 0157008	A	09-08-2001	AU 3669801 A	14-08-2001
			BG 107062 A	30-04-2003
			BR 0108085 A	18-03-2003
			CA 2398754 A1	09-08-2001
			CN 1422262 T	04-06-2003
			EP 1254123 A1	06-11-2002
			HU 0300359 A2	28-06-2003
			JP 2003521543 T	15-07-2003
			NO 20023713 A	04-10-2002
			SK 12712002 A3	04-02-2003
			WO 0157008 A1	09-08-2001
			US 2003153568 A1	14-08-2003
WO 9924035	A	20-05-1999	AU 744281 B2	21-02-2002
			AU 1371999 A	31-05-1999
			BR 9814956 A	03-10-2000
			CA 2309319 A1	20-05-1999
			CN 1290165 T	04-04-2001
			EP 1037632 A1	27-09-2000
			HU 0102101 A2	28-11-2001
			JP 2001522800 T	20-11-2001
			NO 20002121 A	09-05-2000
			NZ 503491 A	28-08-2002
			PL 340727 A1	26-02-2001
			TR 200001312 T2	21-09-2000
			TW 510898 B	21-11-2002
			US 2002123484 A1	05-09-2002
			WO 9924035 A1	20-05-1999
			ZA 9810219 A	22-06-2000
WO 01098290	A	27-12-2001	US 6414013 B1	02-07-2002
			AU 8574501 A	02-01-2002
			CA 2414085 A1	27-12-2001
			WO 0198290 A2	27-12-2001
			EP 1294707 A2	26-03-2003
WO 9602537	A	01-02-1996	WO 9602537 A1	01-02-1996
			EP 0770076 A1	02-05-1997
			JP 10502653 T	10-03-1998
			US 5922733 A	13-07-1999
WO 03070236	A	28-08-2003	WO 03070236 A2	28-08-2003